non-substantive matter. Claims 23, 24 and 25 are new. No new matter has been added by the amendments.

The Office Action rejections are respectfully traversed. Reconsideration and allowance of the claims are hereby respectfully requested.

Rejections Based on the 35 U.S.C. § 102(b)

Claims 11, 13, and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by McCall et al. (U.S. Patent No. 6,473,713). Applicants respectfully traverse the rejections.

An anticipation rejection is proper when a reference teaches each and every element of a claim. *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."). *See Also Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) ("The identical invention must be shown in as complete detail as is contained in the . . . claim.").

Independent claim 11 claims an angular position sensor in conjunction with an alignment system for aligning a centerline of a first shaft with a centerline of a second shaft. The shaft alignment system includes an angular position sensing apparatus having at least one accelerometer for generating a signal corresponding to the angular orientation of a sensor head with respect to the first shaft. A microprocessor processes the signal generated by the at least one accelerometer, and provides an output corresponding to the angular position of the sensor head relative to the first shaft.

McCall describes a processing method for providing attitude and heading measurements of a carrier under dynamic conditions. McCall describes an angular rate producer such as Micro Electronic Mechanical System (MEMS) angular rate device or gyro array for providing three-axis angular rate signals of a carrier. An acceleration producer provides three-axis acceleration signals of the carrier. The angular rate and acceleration signals are processed to obtain the attitude and heading measurements. McCall integrates the angular rate signals to produce digital angular increments (angular measurements) and the accelerometer signals to produce velocity increments (velocity measurements).

In the prior action, the Examiner recognized per a restriction requirement that claims 11-17 are directed to an improvement in an alignment system for aligning centerlines of first and second shafts. MPEP 2111.02, 8th edition, provides guidance as to when the preamble

of a claim is actually a claim limitation. Preamble terminology that limits the structure of the claimed invention is treated as a claim limitation. *See Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989) (The determination of whether preamble recitations are structural limitations can be resolved only on review of the entirety of the application "to gain an understanding of what the inventors actually invented and intended to encompass by the claim."); *See also Pac-Tec Inc. v. Amerace Corp.*, 903 F.2d 796, 801, 14 USPQ2d 1871, 1876 (Fed. Cir. 1990) (determining that preamble language that constitutes a structural limitation is actually part of the claimed invention); *See also Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999) ("If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim.").

McCall does not anticipate claim 11. McCall is not related to an angular position sensing apparatus used to align centerlines of first and second shafts. McCall further does not describe an angular position sensing apparatus comprising at least one accelerometer for generating an acceleration signal and a microprocessor for processing the accelerometer signal to provide an output which corresponds to the angular position of a sensor head relative to the first shaft. Thus, McCall does not describe an angular position sensing apparatus as claimed in amended claim 11. Reconsideration and allowance of claim 11 are respectfully requested.

Dependent claims 13 and 14 depend from independent claim 11, and contain additional important aspects of the angular position sensing apparatus. Therefore, dependent claims 13 and 14 are not anticipated by McCall since McCall does not describe an angular position sensing apparatus comprising at least one accelerometer used in a shaft alignment system for aligning centerlines of first and second shafts. Reconsideration and allowance of dependent claims 13 and 14 are respectfully requested.

As stated above, claim 11 and its dependents are directed to an angular position sensing apparatus in an alignment system for aligning centerlines of first and second shafts and should be considered in this context during examination. One in ordinary skill would not look beyond class 702/subclass 94 and similar alignment devices when attempting to determine the state of shaft alignment art. Accordingly, and following the restriction

requirement, Applicants have added new claims 24 and 25 which are directed to alignment systems for aligning a shaft.

CONCLUSION

Having now fully and completely responded to the office action, applicants assert that the claims are all fully in condition for allowance. Thus, reconsideration and allowance of all claims are respectfully requested.

Applicants assert that the reference can be overcome by filing an affidavit under 37 C.F.R. 1.131 and reserve the right to file the same if the Examiner does not allow the claims as amended by the present amendment.

If the Examiner identifies further issues that may be resolved by telephone, the examiner is invited to contact the undersigned at 1.865.546.4305.

In the event that this response is not timely filed, applicants hereby petition for an appropriate extension of time. The fee for this extension, along with any other fees that may be due with respect to this response, may be charged to our deposit account number 12-2355.

Sincerely,

LUEDEKA, NEELY & GRAHAM, P.C.

By: _____

Andrew S. Neely, #28,979

Date: 1/21/03

P.O. Box 1871
Knoxville TN 37901
1.865.546.4305

* * *

I hereby certify that this correspondence is being deposited on the date below with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington DC 20231.

1/21/03 _____

Date Andrew S. Neely

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MARKED UP VERSION TO SHOW CHANGES

Claim 11. (Twice Amended) In an alignment system for aligning a centerline of a first shaft with a centerline of a second shaft, the shaft alignment system including an analyzer having memory, a mounting bracket having engagement surfaces for engaging the first shaft and securing the bracket to the first shaft, a sensor head having a facing surface and a rear surface in opposing relation disposed on the mounting bracket and extending in a substantially perpendicular orientation with respect to the centerline of the first shaft, a collimated light source mounted on the sensor head for transmitting a beam of energy in a direction that is substantially parallel to the first shaft, and a photosensitive sensor mounted on the sensor head for sensing light and generating a position signal corresponding to a position of a light beam impinging upon the photosensitive sensor, an angular position sensing apparatus comprising:

at least one accelerometer mounted on the sensor head for generating a signal corresponding to the angular orientation of the sensor head with respect to the first shaft, and

a microprocessor for processing the signal generated by the at least one accelerometer, operable to provide an output corresponding to the angular position of the sensor head relative to the first shaft.

Claim 12. (Once Amended) [The angular position sensing apparatus of Claim 11,.] In an alignment system for aligning a centerline of a first shaft with a centerline of a second shaft, the shaft alignment system including an analyzer having memory, a mounting bracket having engagement surfaces for engaging the first shaft and securing the bracket to the first shaft, a sensor head having a facing surface and a rear surface in opposing relation disposed on the mounting bracket and extending in a substantially perpendicular orientation with respect to the centerline of the first shaft, a collimated light source mounted on the sensor head for transmitting a beam of energy in a direction that is substantially parallel to the first shaft, and a photosensitive sensor mounted on the sensor head for sensing light and generating a position signal corresponding to a position of a light beam impinging upon the photosensitive sensor, an angular position sensing apparatus comprising:

at least one accelerometer for generating a signal corresponding to the angular orientation of the sensor head with respect to the first shaft, and

a microprocessor for processing the signal generated by the at least one accelerometer, wherein the microprocessor further comprises an angle processing module for determining a current head quadrant location and determining the angular position of the sensor head based in part on the quadrant location, the microprocessor providing an output corresponding to the angular position of the sensor head relative to the first shaft.

Claim 15. (Once Amended) [The angular position sensing apparatus of Claim 11 further comprising:] In an alignment system for aligning a centerline of a first shaft with a centerline of a second shaft, the shaft alignment system including an analyzer having memory, a mounting bracket having engagement surfaces for engaging the first shaft and securing the bracket to the first shaft, a sensor head having a facing surface and a rear surface in opposing relation disposed on the mounting bracket and extending in a substantially perpendicular orientation with respect to the centerline of the first shaft, a collimated light source mounted on the sensor head for transmitting a beam of energy in a direction that is substantially parallel to the first shaft, and a photosensitive sensor mounted on the sensor head for sensing light and generating a position signal corresponding to a position of a light beam impinging upon the photosensitive sensor, an angular position sensing apparatus comprising:

a first dual-axis accelerometer having a first sensing axis for sensing a first acceleration component and a second sensing axis for sensing a second acceleration component, wherein the first and second sensing axes are in substantially perpendicular relation, the first dual-axis accelerometer operable to output a first signal proportional to the sensed first acceleration component and to output a second signal proportional to the sensed second acceleration component,[and,]

a second dual-axis accelerometer having a third sensing axis for sensing a third acceleration component and a fourth sensing axis for sensing a fourth acceleration component, wherein the third and fourth sensing axes are in substantially perpendicular relation, the second dual-axis accelerometer operable to output a third signal proportional to the sensed third acceleration component and to output a fourth signal proportional to the sensed fourth acceleration component, the first and second dual-axis accelerometers mounted in spaced apart relation defining a plane of reference[.], and

a microprocessor for processing the signals generated by the first and second dual-axis accelerometers, operable to provide an output corresponding to the angular position of the sensor head relative to the first shaft.

Claim 17. (Once Amended) The angular position sensing apparatus of Claim 16 wherein the fifth signal corresponds to a first sine wave function and the sixth signal corresponds to a second sine wave function ninety degrees out of phase with respect to the first sine wave function, wherein the microprocessor determines the angular position of the body based on [the] a most linear region of the first or second sine waves.

Claim 23. (new) The angular position sensing apparatus of claim 15 further comprising processing features for processing the signals from the first and second dual-axis accelerometers to correct for centrifugal and angular acceleration effects.

Claim 24. (new) In an alignment system for aligning a first shaft, a sensing apparatus comprising:

a sensor head coupled to the first shaft,

a collimated light source disposed on the sensor head for transmitting an energy beam,

a photosensitive sensor disposed on the sensor head for sensing light and generating a position signal therefrom,

at least one accelerometer disposed on the sensor head for generating a signal corresponding to the angular orientation of the sensor head with respect to the first shaft, and

a processor for processing the signal generated by the at least one accelerometer, operable to provide an output corresponding to the angular position of the sensor head relative to the first shaft.

Claim 25. (new) The sensing apparatus of claim 19 further comprising:

a first dual-axis accelerometer having a first sensing axis for sensing a first acceleration component and a second sensing axis for sensing a second acceleration component, wherein the first and second sensing axes are in substantially perpendicular relation, the first dual-axis accelerometer operable to output a first signal proportional to the sensed first acceleration component and to output a second signal proportional to the sensed second acceleration component, and

a second dual-axis accelerometer having a third sensing axis for sensing a third acceleration component and a fourth sensing axis for sensing a fourth acceleration component, wherein the third and fourth sensing axes are in substantially perpendicular relation, the second dual-axis accelerometer operable to output a third signal proportional to the sensed third acceleration component and to output a fourth signal proportional to the sensed fourth acceleration component.